

WHAT IS CLAIMED IS

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1. A code conversion apparatus comprising:  
input means for inputting compressed and  
transformed input codes;  
header information rewriting means for rewriting  
10 only header information within the codes so as to change  
a decoded state of the input codes; and  
output means for outputting the codes, including  
rewritten header information, to a target object.

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2. A code conversion apparatus comprising:  
an input section to input compressed and  
20 transformed input codes;  
a header information rewriting section to rewrite  
only header information within the codes so as to change  
a decoded state of the input codes; and  
an output section to output the codes, including  
25 rewritten header information, to a target object.

3. A code conversion apparatus comprising:  
input means for inputting compressed and  
transformed input codes;  
header information rewriting means for rewriting  
5 only header information within the codes so as to  
partially decode the input codes; and  
output means for outputting the codes, including  
rewritten header information, to a target object.

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4. A code conversion apparatus comprising:  
an input section to input compressed and  
15 transformed input codes;  
a header information rewriting section to rewrite  
only header information within the codes so as to  
partially decode the input codes; and  
an output section to output the codes, including  
20 rewritten header information, to a target object.

25 5. The code conversion apparatus as claimed

in claim 4, wherein the codes are JPEG2000 format codes which have been subjected to a discrete wavelet transform.

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6. The code conversion apparatus as claimed in claim 4, wherein the header information rewritten by said header information rewriting section includes a number of elements in a highest level of a progressive order and header information related to the elements.

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7. The code conversion apparatus as claimed in claim 6, wherein the elements in the highest level of the progressive order are layers (L), and the header information to be rewritten includes information related to a number of the layers.

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8. The code conversion apparatus as claimed  
in claim 7, wherein said header information rewriting  
section rewrites the header information to reduce by n a  
number of layers of a marker segment SGcod of a default  
5 coding style marker (COD) within the header information  
when reducing the number of layers by n.

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9. The code conversion apparatus as claimed  
in claim 6, wherein the elements in the highest level of  
the progressive order are resolution levels (R), and the  
header information to be rewritten is information  
15 related to an image size, a tile size, a number of  
resolution levels and a number of bit planes for every  
sub-band to be encoded.

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10. The code conversion apparatus as claimed  
in claim 9, wherein the header information includes  
information related to a precinct size when a precinct  
25 is user defined.

11. The code conversion apparatus as claimed  
in claim 9, wherein said header information rewriting  
section multiplies  $1/2^n$  to the image size and the tile  
size, reduces the number of resolution levels by  $n$ ,  
5 reduces the precinct size by  $3n$ , and deletes entries  
amounting to  $3n$  bytes and related to the number of bit  
planes for every sub-band to be encoded, when  
multiplying the resolution level by  $1/2^n$ .

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12. The code conversion apparatus as claimed  
in claim 6, wherein the elements in the highest level of  
15 the progressive order are a number of components ( $C$ ),  
and the header information to be rewritten includes a  
number of components and information related to sub-  
sampling for every component.

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13. The code conversion apparatus as claimed  
in claim 12, wherein the header information to be  
25 rewritten includes information related to existence of a

component transform when codes have been subjected to  
component transform.

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14. The code conversion apparatus as claimed  
in claim 12, wherein said header information rewriting  
section reduces by  $3n$  a value of a marker segment  $Lsiz$   
10 of a size marker (SIZ) within the header information,  
reduces by  $n$  a value of a marker segment  $Csiz$ , and  
deletes an amount corresponding to  $n$  components with  
respect to marker segments  $Ssiz$ ,  $XRsiz$  and  $Rsiz$  when  
reducing the number of components by  $n$ .

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15. The code conversion apparatus as claimed  
20 in claim 14, wherein said header information rewriting  
section appropriately rewrites to 0 a content of a  
marker segment  $SGcod$  of a default coding style marker  
(COD) within the header information, as information  
related to existence of component transform, when the  
25 codes have been subjected to component transform.

16. The code conversion apparatus as claimed  
in claim 4, wherein said header information rewriting  
section rewrites header information related to image  
size.

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17. The code conversion apparatus as claimed  
10 in claim 16, wherein said header information rewriting  
section rewrites header information including a marker  
segment Isot indicating a tile number of a tile start  
marker (SOT).

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18. The code conversion apparatus as claimed  
in claim 4, further comprising:

20 a code deleting section to delete a code which is  
no longer a target of a partial decoding due to  
rewriting of the header information by said header  
information rewriting section.

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19. The code conversion apparatus as claimed  
in claim 9, wherein said header information rewriting  
section rewrites only header information for a  
resolution level so that the resolution level becomes a  
5 multiple of 2 to the Nth power ( $2^N$ ) closest to a desired  
multiplication factor which is not 2 to the Nth power  
( $2^N$ ) but multiplied to the resolution level to obtain a  
desired resolution level, and further comprising:

a decoding section to decode the codes including  
10 the rewritten header information; and

a final multiplication factor adjusting section to  
adjust an image obtained by said decoding section so as  
to have the desired resolution level, based on an  
interpolation method using interpolation or decimation.

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20. A code conversion apparatus comprising:

20 input means for inputting compressed and  
transformed input codes of an original image;

header information rewriting means for rewriting  
only header information within the codes so as to decode  
the codes into an image having a higher resolution than  
25 the original image; and



output means for outputting the codes, including  
rewritten header information, to a target object.

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21. A code conversion apparatus comprising:  
an input section to input compressed and  
transformed input codes of an original image;  
10 a header information rewriting section to rewrite  
only header information within the codes so as to decode  
the codes into an image having a higher resolution than  
the original image; and  
an output section to output the codes, including  
15 rewritten header information, to a target object.

20 22. The code conversion apparatus as claimed  
in claim 21, wherein the codes are JPEG2000 format codes  
which have been subjected to a discrete wavelet  
transform.

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23. The code conversion apparatus as claimed  
in claim 21, wherein the header information rewritten by  
said header information rewriting section includes a  
number of elements in a highest level of a progressive  
5 order, and header information related to the elements,  
including an image size, a tile size and a number of  
resolution levels.

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24. The code conversion apparatus as claimed  
in claim 23, wherein said header information rewriting  
section multiplies  $2^n$  to the image size and the tile  
15 size, and increases the number of resolution levels by  $n$ ,  
when multiplying the resolution level by  $2^n$ .

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25. The code conversion apparatus as claimed  
in claim 21, wherein said header information rewriting  
section rewrites only header information for a  
resolution level so that the resolution level becomes a  
25 multiple of 2 to the  $N$ th power ( $2^N$ ) closest to a desired

multiplication factor which is not 2 to the Nth power ( $2^N$ ) but multiplied to the resolution level to obtain a desired resolution level, and further comprising:

5 a decoding section to decode the codes including the rewritten header information; and

a final multiplication factor adjusting section to adjust an image obtained by said decoding section so as to have the desired resolution level, based on an interpolation method using interpolation or decimation.

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26. A code conversion method comprising the  
15 steps of:

(a) inputting compressed and transformed input codes;

(b) rewriting only header information within the codes so as to change a decoded state of the input  
20 codes; and

(c) outputting the codes, including rewritten header information, to a target object.

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27. A code conversion method comprising the steps of:

(a) inputting compressed and transformed input codes;

5 (b) rewriting only header information within the codes so as to partially decode the input codes; and

(c) outputting the codes, including rewritten header information, to a target object.

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28. The code conversion method as claimed in claim 27, wherein the codes are JPEG2000 format codes  
15 which have been subjected to a discrete wavelet transform.

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29. The code conversion method as claimed in claim 27, wherein the header information rewritten by said step (b) includes a number of elements in a highest level of a progressive order and header information  
25 related to the elements.

30. The code conversion method as claimed in claim 29, wherein the elements in the highest level of the progressive order are layers (L), and the header information to be rewritten includes information related to a number of the layers.

10 31. The code conversion method as claimed in claim 29, wherein the elements in the highest level of the progressive order are resolution levels (R), and the header information to be rewritten is information related to an image size, a tile size, a number of resolution levels and a number of bit planes for every sub-band to be encoded.

20 32. The code conversion method as claimed in claim 31, wherein the header information includes information related to a precinct size when a precinct is user defined.

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33. The code conversion method as claimed in claim 29, wherein the elements in the highest level of the progressive order are a number of components (C), and the header information to be rewritten includes a  
5 number of components and information related to sub-sampling for every component.

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34. The code conversion method as claimed in claim 33, wherein the header information to be rewritten includes information related to existence of a component transform when codes have been subjected to component  
15 transform.

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35. The code conversion method as claimed in claim 27, wherein said step (b) rewrites header information related to image size.

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36. The code conversion method as claimed in claim 35, wherein said step (b) rewrites header information including a marker segment Isot indicating a tile number of a tile start marker (SOT).

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37. The code conversion method as claimed in claim 27, further comprising the steps of:

(d) deleting a code which is no longer a target of a partial decoding due to rewriting of the header information by said step (b).

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38. A code conversion method comprising the steps of:

- 20 (a) inputting compressed and transformed input codes of an original image;
- (b) rewriting only header information within the codes so as to decode the codes into an image having a higher resolution than the original image; and
- 25 (c) outputting the codes, including rewritten

header information, to a target object.

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39. The code conversion method as claimed in claim 38, wherein the codes are JPEG2000 format codes which have been subjected to a discrete wavelet transform.

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40. The code conversion method as claimed in claim 21, wherein the header information rewritten by said step (b) includes a number of elements in a highest level of a progressive order, and header information related to the elements, including an image size, a tile size and a number of resolution levels.

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41. A computer-readable storage medium which stores a program for causing a computer to carry out a

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code conversion process, said program comprising:

an input procedure causing the computer to input  
compressed and transformed input codes;

a header information rewriting procedure causing  
5 the computer to rewrite only header information within  
the codes so as to change a decoded state of the input  
codes; and

an output procedure causing the computer to output  
the codes, including rewritten header information, to a  
10 target object.

15 42. A computer-readable storage medium which  
stores a program for causing a computer to carry out a  
code conversion process, said program comprising:

an input procedure causing the computer to input  
compressed and transformed input codes;

20 a header information rewriting procedure causing  
the computer to rewrite only header information within  
the codes so as to partially decode the input codes; and

an output procedure causing the computer to output  
the codes, including rewritten header information, to a  
25 target object.

43. The computer-readable storage medium as claimed in claim 42, wherein the codes are JPEG2000 format codes which have been subjected to a discrete wavelet transform.

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44. The computer-readable storage medium as claimed in claim 42, wherein the header information rewritten by said header information rewriting procedure includes a number of elements in a highest level of a progressive order and header information related to the elements.

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45. The computer-readable storage medium as claimed in claim 44, wherein the elements in the highest level of the progressive order are layers (L), and the header information to be rewritten includes information related to a number of the layers.

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46. The computer-readable storage medium as  
claimed in claim 44, wherein the elements in the highest  
level of the progressive order are resolution levels (R),  
and the header information to be rewritten is  
5 information related to an image size, a tile size, a  
number of resolution levels and a number of bit planes  
for every sub-band to be encoded.

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47. The computer-readable storage medium as  
claimed in claim 46, wherein the header information  
includes information related to a precinct size when a  
15 precinct is user defined.

20 48. The computer-readable storage medium as  
claimed in claim 44, wherein the elements in the highest  
level of the progressive order are a number of  
components (C), and the header information to be  
rewritten includes a number of components and  
25 information related to sub-sampling for every component.

49. The computer-readable storage medium as  
claimed in claim 48, wherein the header information to  
be rewritten includes information related to existence  
of a component transform when codes have been subjected  
5 to component transform.

10 50. The computer-readable storage medium as  
claimed in claim 42, wherein said header information  
rewriting procedure rewrites header information related  
to image size.

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51. The computer-readable storage medium as  
claimed in claim 50, wherein said header information  
20 rewriting procedure rewrites header information  
including a marker segment Isot indicating a tile number  
of a tile start marker (SOT).

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52. The computer-readable storage medium as claimed in claim 43, wherein said program further comprises:

5 a deleting procedure causing the computer to delete a code which is no longer a target of a partial decoding due to rewriting of the header information by said header information rewriting procedure.

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53. A computer-readable storage medium which stores a program for causing a computer to carry out a code conversion process, said program comprising:

15 an input procedure causing the computer to input compressed and transformed input codes of an original image;

a header information rewriting procedure causing the computer to rewrite only header information within  
20 the codes so as to decode the codes into an image having a higher resolution than the original image; and

an output procedure causing the computer to output the codes, including rewritten header information, to a target object.

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54. The computer-readable storage medium as claimed in claim 53, wherein the codes are JPEG2000 format codes which have been subjected to a discrete wavelet transform.

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55. The computer-readable storage medium as claimed in claim 53, wherein the header information rewritten by said header information rewriting procedure includes a number of elements in a highest level of a progressive order, and header information related to the elements, including an image size, a tile size and a number of resolution levels.

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